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The intra-annual variation of DOC and POC and its importance for the annual carbon balance of a blanket peat catchment

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The study site is a lowland blanket bog situated in Glencar, County Kerry in Southwest Ireland. This work focuses on the riverine export of C as dissolved organic carbon (DOC) and particulate organic carbon (POC) for the year 2007. In January 2007, continuous in-situ measurements were started using spectroanalyser instrumentation that gives half-hourly estimates of the concentration of DOC and total organic carbon (TOC) in the stream draining the catchment. These results are additionally calibrated using a 24-bottle sampler at about six week intervals from which DOC and TOC are analysed in the laboratory using a TOC-V cpH (SHIMADZU). Comparing the annual export (loss) of DOC with values from previous years for the gaseous atmospheric exchange components CO_2 and CH_4 shows that the fluvial loss of carbon as DOC ($\sim$120 kg C ha^{-1} yr^{-1}) is more than twice as important as the flux of carbon as CH_4 ($\sim$50 kg C ha^{-1} yr^{-1}). The flux of carbon as CO_2 ($\sim$ 630 kg C ha^{-1} yr^{-1}), which shows a sink magnitude, is still the major component contributing to the annual carbon balance but exhibiting an important annual variation (264 to 959 kg C ha^{-1} yr^{-1} within a four year period) . Furthermore rainfall events were examined over the whole year showing that there are seasonal changes in the reaction of the concentrations of DOC and TOC to changes in stream height. The loss of DOC is lowest in wintertime and is almost independent of stream height. It is highest in the late summer and is then dependent on stream height. DOC was not subject to flushing out in the late summer/autumn period but at these times the POC was significant.